Mount Baker-Snoqualmie National Forest

Specialist Report
Environmental Assessment

S.F. Stillaguamish Vegetation Project

Special Status and Invasive Plants

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Table of Contents

List of Tables

1. Introduction

The purpose of this Special Status Plants and Invasive Plants Specialist Report is to analyze the South Fork Stillaguamish Vegetation Management Project in sufficient detail to determine whether the project actions would affect the aforementioned species known to occur or suspected in the project area.

This document only analyzes special status plants and invasive plants. It is assumed general vegetation would be impacted by timber harvest, road construction, and/or connected activities, recreation enhancement, and travel access management changes, therefore it will not be addressed within this analysis. This report will be stored in the Project Record, along with any cited or referenced data, tables, maps, affected environment, analysis, references, reports, and technical documentation relied upon to reach this analysis' conclusions.

2. Project Description

The project proposes to complete the following:

1.) Forest Stand Treatments and connected actions
2.) Aquatic Restoration Activities
3.) Recreation Enhancement Activities
4.) Access Travel Management

3. Applicable Laws, Regulations, and Policies

36 Code of Federal Regulations 219.27 states management prescriptions, when appropriate and to the extent practicable shall preserve and enhance the diversity of plant and animal communities.

Executive Order 13751 of December 5, 2016 directs Federal agencies to continue coordinated prevention and control efforts towards invasive species.

Executive Order 13112 of February 3, 1999 states each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law, not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

1990 Mt. Baker-Snoqualmie National Forest (herein MBSNF) Land and Resource Management Plan (herein Forest Plan), as amended in 2005. (USDA Forest Service, 1990)

1994 Northwest Forest Plan Record of Decision (herein NW Forest Plan) for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl - Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl, as amended by the 2001 Record of Decision. (USDA Forest Service and USDI Bureau of Land Management, 1994)

2005 Forest Service Manual 2672.4 - Wildlife, Fish, and Sensitive Plant Habitat Management, Biological Evaluations, p. 8: Review all Forest Service planned, funded, executed, or permitted programs and activities for possible effects on endangered, threatened, proposed, or sensitive species. The biological evaluation is the means of conducting the review and of documenting the findings.

2008 Forest Service Manual 2070.3 – Vegetation Ecology, p. 7: Ensure genetically appropriate native plant materials are given primary consideration. Restrict use of persistent**,** non-native, non-invasive plant materials to only those situations when timely reestablishment of a native plant community either through natural regeneration or with the use of native plant materials is not likely to occur.

4. Relevant Standards and Guidelines

1990 Forest Plan - Threatened, Endangered, and Sensitive Species, p. 4-127: In the design of projects for implementation where such [TES] species, areas, or habitats are known to occur, insure that appropriate action is taken to protect these species, areas, and habitats.

1994 NW Forest Plan - Survey and Manage, Attachment A p. C- 4-6: 1) Manage known sites; 2) Survey prior to ground disturbing actions. The provisions stipulated in the October 2006 modification (Northwest Ecosystem Alliance, et al. v. Mark E. Rey, et al., No. C04-844P [District Court Order of January 2006, modified October 11, 2006]) states that Survey and Manage Standards and Guidelines do not apply to thinning projects in stands less than 80 years old (see Other Programmatic Direction below).

2005a Forest Plan Amendment, Forest-wide Environmental Assessment for Invasive Plants Record of Decision, Prevention Strategy/Best Management Practices for Noxious Weed Management, p. A-5, provides management direction for invasive species within the MBS planning area.

2005b Forest Plan Amendment, Region Six Record of Decision for Preventing and Managing Invasive Plants, provides management direction for invasive species within the Pacific Northwest Region.

2015 Forest Plan Amendment, Mt. Baker-Snoqualmie National Forest Invasive Plant Treatment Record of Decision, provides management direction for treatment of invasive plants within the MBS planning area.

5. Other Programmatic Direction

Federal agencies (BLM and Forest Service) are currently implementing the January 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, the December 2003 species list with Red tree vole as Category C across its range and giving special consideration to 12 species, and the four categories of projects exempt from the Survey and Manage standards and guidelines as stipulated by Judge Pechman (October 11, 2006 "Pechman Exemptions").

Survey and Manage Project Exemptions–Northwest Ecosystem Alliance, et al. v. Mark E. Rey, et al., No. C04-844P (District Court Order of January 2006, modified October 11, 2006): This court order re-instated the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measure Standards and Guidelines. The October 2006 modification allowed four categories of activities to proceed without performing pre-disturbance Survey and Manage related surveys and known site management, also known as the "Pechman Exemptions." These categories are: 1) thinning in forest stands younger than 80 years of age, 2) culvert replacement/removal, 3) riparian and stream improvement projects including the decommissioning of roads, and 4) hazardous fuel treatments, which apply prescribed fire.

6. Definitions of Technical Terms

Botanical resources herein refer to special status and invasive plants.

Invasive species is one whose introduction does or is likely to cause economic or environmental harm or harm to human health (EO 13112). Herein the term "invasive species" refers to invasive plant species. Only those species that are listed in Categories A, B, and C of the 2016 Washington State Noxious Weed List are considered High Priority for treatment (Table 1). Species that are not rated (NR) may also be considered if they pose a threat to the establishment of native species.

Table 1. 2016 WA State Noxious Weed Ratings

Weed Class	Definition
A	Non-native species whose distribution in WA is still limited. Eradication of Class A plants required by law.
B	Non-native species presently limited to portions of the State. Species are designated for control in regions where they are not yet widespread.
C	Noxious weeds which are already widespread in WA.

Plants herein refer to all vascular and non-vascular plants, lichens, and fungi. The term "plants" will be used colloquially to refer to the above mentioned species.

Propagule herein refers to any plant part or structure that can give rise to a new individual, such as rhizomes, corms, or seeds.

Sensitive species are those plants, fungi, and/or lichen species designated by the Regional Forester based on concern for known or predicted downward trends in population viability. The Pacific Northwest Region's (herein R6) Sensitive Species List was last revised and signed by the Regional Forester on July 13th, 2015. Based on new information, additional species have been added to the list as documented or suspected on the MBSNF.

Special status herein refers to those species including, but not limited to: Region 6 Sensitive plants and fungi species, Northwest Forest Plan Survey and Manage plants, lichens, and fungi species, Region 6 Strategic Species, and Washington State Natural Heritage Program Rare Plant Species.

Species herein refers to plant, lichen, and fungi species.

Survey and Manage species (S&M) are those plants determined to be associated with/or an indicator of late-successional or old-growth forest within the range of the Northern spotted owl. The 2003 Species Review of the 2001 Northwest Forest Plan Record of Decision contains the species list used for this analysis, including an additional eight species and/or species ranks from the 2001 list. Survey and Manage Categories are defined in Table 2.

Table 2. Survey and Manage categories and management direction for each category

Relative Rarity	Pre-Disturbance Surveys Practical	Pre-Disturbance Surveys Not Practical	Status Undetermined
Rare	**Category A** Manage All Known Sites	**Category B** Manage All Known Sites	**Category E** Manage All Known Sites
Uncommon	**Category C** Manage High Priority Sites	**Category D** Manage High Priority Sites	**Category F** Management of known sites not required

Threatened and endangered species are those listed in accordance with the Endangered Species Act of 1973. Federal candidate species recognized by US Fish and Wildlife Service as those currently under consideration for listing but not yet formally proposed for listing. On the MBSNF, whitebark pine (*Pinus albicaulis*) is a federal candidate. It is also on the R6 Sensitive species list.

7. Management Requirements and Mitigation Measures

The following Standards from the Forest Plan, as amended (2005, 2005a, 2015), apply to Alternative 2:

	Mitigation Measure or Project Design Feature	Objective	Effectiveness and Basis	Forest Plan Standard & Guideline	Enforcement
	Vegetation And Plants				
1	If any previously undiscovered TES or other rare or uncommon vascular plants, bryophytes, lichens, or fungi are discovered, before or during project implementation, halt work until a USFS botanist is consulted and necessary mitigation measures are enacted.	Prevent impact to TES or S&M plants	HIGH (logic)	Forest Plan p. 4-127, USDA Forest Service 1990.	Contract Administrator
2	Treat known infestations *before* ground disturbance begins. To be effective a lag time of 2 weeks is needed between the time of treatment and the time of ground disturbance.	Eradicate known infestations	Moderate (USDA Forest Service 2005a)	Best Management Practices, USDA Forest Service 1999, Forest Plan S&G #16, USDA Forest Service 2005a.	Contract Administrator
3	For actions conducted or authorized by written permit by the Forest Service that will operate outside the limits of the road prism, require the cleaning of all heavy equipment *prior to entering NFS Lands.*	Prevent introduction of weeds into the MBSNF	MODERATE (USDA Forest Service 2005a)	Forest Plan S&G #2, USDA Forest Service 2005a	Contract Administrator
4	Suppliers must provide documentation indicating that the following products have been examined by a qualified inspector and deemed free of State listed noxious weeds: • Straw or other Mulch[1] • Gravel, Rock, or other fill • Seeds (according to AOSA standards)	Prevent introduction of weeds	MODERATE (USDA Forest Service 2005a)	Forest Plan S&G #3 and7, USDA Forest Service 2005a, Forest Plan Best Management Practices, USDA Forest Service 1999	Contract Administrator
5	If weeds are present in the project area, all equipment and gear must be cleaned *before leaving the project area* to avoid spreading the infestation further.	Prevent weed spread	HIGH (USDA Forest Service 1999)	Best Management Practices, USDA Forest Service 1999	Contract Administrator
6	If weeds are present in the project area, work from relatively weed-free areas into the infested area rather than vice versa.	Prevent weed spread	MODERATE (logic).	Best Management . Practices, USDA Forest Service 1999	Contract Administrator
7	Revegetate all areas of bare soil exposed by project activities if there is a risk of noxious weed invasion. Native plant materials are the first choice in revegetation where timely natural regeneration of the native plant community is not likely to occur. If native plant materials are not available, use the appropriate MBS non-native seedmix (per Potash and Aubry 1997).	Prevent erosion, prevent introduction and spread of weeds, maintain and restore habitat	HIGH (USDA Forest Service 2005a)	Forest Plan S&G #13, USDA Forest Service 2005a, Best Mgt. Practices, USDA Forest Service 1999, ACS S&G # 8 & 9, USDA Forest Service & USDI Bureau of Land Management 1994.	Contract Administrator
8	For Washington State Class A and B designate noxious weeds[2]: treat with the most effective method; after treatment has taken effect, cover the infestation with geotextile fabric to avoid spreading seed or roots remaining in the soil. Avoid disturbance to area. If disturbance cannot be avoided, treat infestation first, then wash equipment after working in the infested area before moving into an uninfested area.	Eradicate known infestations and prevent weed spread	High	WAC Chapter 16-750, RCW 17.10	Contract administrator.

[1] Please note that weed free straw for erosion control must be certified by WA State via the WWHAM program http://agr.wa.gov/PlantsInsects/WWHAM/WWHAM.aspx

8. Analysis Methodology, Assumptions

Methods of analysis used to complete this report include a quantitative analysis of the botany occurrence and survey data stored within the Natural Resource Manager (herein NRM) Natural Resource Information Systems (herein NRIS) TESP-Invasives application, with Geographic Information Systems (herein GIS) in conjunction with the MBS GIS Library. Records were queried on August 24th, 2016. In addition, the data from the South Fork Stillaguamish Botany Survey Contract and Gold Basin Botany Survey Contract were used.

The project area herein refers to those National Forest System lands managed by the MBSNF encompassing the area in the South Fork Stillaguamish River Watershed (Hydrologic Unit Code 10) as depicted in the GIS layer "ProjectArea091015". This Analysis Area is 65,228 acres in size.

Silvicultural treatment may occur across 12,685 acres of stands within the project area. It is estimated that a maximum of 50% of this area would receive treatment once no-cut areas have been removed, and field verification has occurred. Treatments would likely occur in those stands with a high to moderate potential, as indicated in the Potential_Project_Stands layer, and in non-commercial thinning stands. No ground-disturbing actions would occur in non-commercial thinning stands, however Alternative 2B does propose converting several non-commercial stands in Alternative 2 and 2A into commercial thinning prescriptions.

It is assumed that stand exams would be completed in all stands prior to harvest layout and implementation. Stand exams would determine stand age, and any stand older than 80-years of age at the time of the Decision Notice would be dropped from harvest. Increment cores within the stand exam are used to make the basis for stand age. However, if stand exams are not completed, then stand age may also be determined based on professional experience. The most likely scenario based on field work completed during the planning process, portions of stands may be found to be greater than 80-years of age, but finding entire stands greater than 80-years of age are unlikely. Between the draft Environmental Assessment (EA) and the final EA, stand exams determined portions of g75, g77, and u188 were greater than 80-years of age.

Legacy or old growth remnant trees are present and occur sporadically throughout the project area. All stands that would receive treatments are less than 80 years of age thus exempt to Survey and Manage Requirements under the Pechman Exemption. The actions connected with stand treatments such as temporary road construction to access the stand and daylighting of roads to facilitate the movement of harvest equipment are also exempt. (USDA Forest Service and USDI Bureau of Land Management, 1994)

Ground disturbing actions may occur with proposed road maintenance levels on 197 miles of the existing road system in the project area. Whereas most ground disturbing activities take place within the road prism as defined from the top of the cut bank to the toe of the fill, the vegetation clearing limit typically extends beyond this point. Collectively, the road prism plus the clearing limit are herein referred to as the road right-of-way (ROW). The width of the ROW depends on the road maintenance level in addition to roadside variables such as soil type, rock features, riparian zones, etc. Distances from the road center used in the analysis were estimates based on average road widths and average distances from the road edge where treatment or maintenance activities would take place. For ease of analysis, an average of 33-feet from the road center line was used to delineate the ROW. The proposed actions of replacing and/or removing culverts and decommissioning roads are exempt to Survey and Manage Requirements under the Pechman Exemption (USDA Forest Service and USDI Bureau of Land Management, 1994).

Spatial discrepancies exist within NRIS. Location certainties vary among occurrence records depending on the data source. For some species in which presence is based on historical records, actual on the ground location of the species is unknown, thus locational certainty is low. For example, some rare plant occurrences are mapped very broadly. The mapped polygons are much larger than the actual on the ground extent of occupied area. Thus, the spatial depiction of the occurrence does not represent what is

actually present on the ground. Professional experience was used to determine whether those species with high locational uncertainty (greater than 30-feet) have the potential to occur in the area of potential impact within the project area.

Throughout this analysis, common plants and invasive plants will be referred to by their common names. The first written expression for a common or invasive plant will be followed by the scientific name in parenthesis. Few Special Status bryophytes or lichens have common names, therefore Special Status species will always be referred to by their scientific name.

A pre-field review of the project area occurred on February 23, 2016. NRIS TESP-IP was filtered for both special status and invasive plants documented in the project area. A target species list of known and suspected special status plants was compiled based on documented records and professional experience of habitats known or suspected in the project area (**Error! Reference source not found.**). Stand exam data, Vegetation Stand Age layer, Plant Association layer, the National Wetland Inventory layer, and aerial imagery were reviewed in GIS. Based on known information, approximately 1700 acres of proposed stands were targeted for surveys based on the potential for the following habitats and/or microclimates: moist to mesic forest in older stands; area with the potential for wetland features outside known riparian reserves or inventoried wetlands; the potential for forested wetlands; and rocky, talus, or scree areas. 132 miles of the existing road system was targeted for invasive plant surveys based on the proposed road system needed to haul timber at that time. The pre-field review for rare plants can be found in the Project Record. A pre-field review for invasive plants was not completed.

It is assumed that maintaining the microclimate around a rare plant will ensure viability after project implementation. The buffer size required for this project is based on previous work completed across the Region in conjunction with the Regional Ecosystem Office, and/or previous buffers used on the Forest in other projects, and/or habitat requirements for the species in question.

This report is primarily a qualitative assessment based on professional experience. It discloses current information and analyzes proposed actions as described in *Section 1. Project Description* of this analysis. Small calculation differences may exist due to rounding. A new or revised report will be required if: 1) the Proposed Action is modified in a manner that cause new effects not previously considered; 2) new information becomes available that reveals the actions may affect Special Status plants or invasive plants and/or their potential suitable habitat in a manner or to an extent not previously considered and disclosed; 3) a new rare plant is listed; or, 4)the project is modified in a way to necessitate additional analysis, such as the addition of an alternative.

9. Affected Environment

The project is located within the Northern Cascades Physiographic Province (Franklin & Dyrness, 1973) on the Darrington Ranger District of the MBSNF, Washington, entirely within the South Fork Stillaguamish River Watershed. The legal location for the project is: T29N R9E, R10E, and R11E; T29N, R8E, R9E, R10E, and R11E; and in T31N R8E. Elevation in the project area ranges from approximately 883 feet at the valley bottom to 6,169 feet along the ridgeline.

The project area is a botanically diverse region of the MBSNF. Multiple rare plant species occur within the Watershed that are not known to occur or occur infrequently elsewhere on the Forest, including *Bartramiosis lescurri* and *Coptis asplenifolia*. Three Research Natural Areas (Lake Twenty-two, Perry Creek, and Long Creek), whose purpose is to preserve the natural and biological components of the designated area free from human disturbance as possible, are present within the project area.

Between June 20th and August 3rd botanical surveys were conducted across selected sections of stands in the project area. Intuitive controlled surveys targeting suspected R6 Sensitive plants and high priority

invasive plants were completed across 1810 acres[2] of proposed stands. Incidental sightings of Survey and Manage species were documented. Also during this survey period, general surveys targeting high priority invasive plants were completed within the ROW of 132 miles of open and closed roads. During the summer of 2017 and 2018, complete surveys of the proposed recreation enhancement sites were surveyed for R6 Sensitive species and Survey and Manage Category A and C species. Attachment 6 lists all surveys completed priori to 2018 documented in the project area.

Stands proposed for vegetation management within the project area can be described as second-growth and range from 30 to 80 years old. The dominant species in the project area are Western hemlock (*Tsuga heterophylla*), Pacific silver fir (*Abies amabilis*), Douglas-fir (*Pseudotsuga menziesii*), and western redcedar (*Thuja plicata*). Red alder (*Alnus rubra*) is present in moist flats and in riparian zones. Legacy or remnant old-growth trees are present and sporadically distributed throughout the stands; however, the vast majority of trees are under 80 years in age. Hardwoods are represented by vine maple (*Acer circinatum*) and bigleaf maple (*Acer macrophyllum*). Other unique habitats include talus slopes, rock outcrops, and emergent wetlands.

Roads proposed for maintenance level changes within the project area are highly disturbed. They are frequently maintained through general activities such as mowing, brushing, ditch cleaning, grading and slide removal, culvert cleaning, slope repair, etc. The edge of the road is a habitat that typically receives more light than the surrounding forest, and additional water from road run-off. Plant species that tend to inhabit the road edge are typically early colonizers or invasive. Because the ROW is highly disturbed, there is no suitable habitat for any Survey and Manage Category A or C species, therefore surveys targeting those species were not required for this project.

Recreation enhancement sites were either within the highly disturbed road ROW or within proposed treatment stands.

Special Status Plants

Threatened and Endangered Species

No federally listed threatened, endangered, (T&E) or proposed species are known to occur on the MBS. No formal consultation is required. T&E species will not be addressed any further in this document.

Rare Species

Approximately 41 R6 Sensitive species and/or NWFP Survey and Manage Category A or C species are suspected in the project area based on the project area's geographic location in relation to known occurrences and the potential for suitable habitat within the project area. Of the species suspected in the project area, 28 are Sensitive species or species of concern and 12 are Survey and Manage species; 1 species is a fungus, 31 are vascular plants, 3 are bryophytes, and 6 are lichen species. Suspected species are listed in Table 3.

Table 3. Special Status Species Suspected in the Project Area

#	Special Status	Lifeform	NRCS PLANTS Code	Scientific Name	Common Name
1	WA-SEN	Moss	BALE6	*Bartramiopsis lescurii*	Moss
2	SEN	Vascular plant	BOAS2	*Botrychium ascendens*	Upward-lobed moonwort
3	S&M Cat A	Vascular plant	BOMO	*Botrychium montanum*	Mountain grape-fern

[2] Surveys were completed of the stands identified during the pre-field review of having high potential suitable habitat for known or suspected R6 Sensitive species.

4	SEN	Vascular plant	BOPE4	*Botrychium pedunculosum*	Stalked moonwort
5	S&M Cat A	Fungus	BRNO8	*Bridgeoporus nobilissimus*	Fungus
6	WA-SEN	Vascular plant	CALA7	*Campanula lasiocarpa*	mountain harebell
7	SEN	Vascular plant	CACO8	*Carex comosa*	Bristly sedge
8	SEN	Vascular plant	CAMA11	*Carex macrochaeta*	Large-awn sedge
9	WA-SEN	Vascular plant	CAMAI2	*Carex magellanica ssp. irrigua*	Poor sedge
10	WA-SEN	Vascular plant	CAPA19	*Carex pauciflora*	Few-flowered sedge
11	WA-SEN	Vascular plant	CARO6	*Carex rostrata*	Beaked sedge
12	WA-SEN	Vascular plant	CAST10	*Carex stylosa*	Long-styled sedge
13	WA-SEN	Vascular plant	CIBU	*Cicuta bulbifera*	Bulb-bearing water-hemlock
14	S&M Cat A & WA-SEN	Vascular plant	COAS	*Coptis aspleniifolia*	Spleenwort-leaved goldthread
15	S&M Cat A	Vascular plant	COTR2	*Coptis trifolia*	Three-leaved goldthread
16	S&M Cat A	Vascular plant	COAQ	*Corydalis aquae-gelidae*	Cold water corydalis
17	S&M Cat C	Vascular plant	CYMO2	*Cypripedium montanum*	Mountain lady's slipper
18	S&M Cat A	Lichen	DEIN12	*Dendriscocaulon intricatulum*	Lichen
19	WA-SEN	Lichen	DEME5	*Dermatocarpon meiophyllizum*	Lichen
20	WA-SEN	Vascular plant	DRDRD	*Dryas drummondii var. drummondii*	Drummond's mountain-avens
21	WA-SEN	Vascular plant	ERSA17	*Erigeron salishii*	Salish fleabane
22	WA-SEN	Vascular plant	EUME17	*Eurybia merita*	Arctic aster
23	SEN	Vascular plant	FRCA5	*Fritillaria camschatcensis*	Black lily
24	S&M Cat C	Lichen	HYDU60	*Hypogymnia duplicata*	Lichen
25	WA-SEN	Vascular plant	LOPR	*Kalmia procumbens*	Alpine azalea
26	S&M Cat A & SEN	Lichen	LECY60	*Leptogium cyanescens*	Lichen
27	SEN	Vascular plant	LYIN2	*Lycopodiella inundata*	Bog club-moss
28	WA-SEN	Vascular plant	LYDE	*Lycopodium dendroideum*	Treelike clubmoss
29	WA-SEN	Vascular plant	MIBO	*Microseris borealis*	Northern microseris
30	WA-SEN	Vascular plant	MODI3	*Montia diffusa*	Branching montia
31	SEN	Vascular plant	OPPU3	*Ophioglossum pusillum*	Adder's-tongue
32	SEN	Vascular plant	PIAL	*Pinus albicaulis*	whitebark pine
33	WA-SEN	Vascular plant	PLCH3	*Platanthera chorisiana*	Choris' bog-orchid
34	SEN	Vascular plant	PLOB	*Platanthera obtusata*	Small northern bog-orchid
35	S&M Cat C	Vascular plant	PLORO	*Platanthera orbiculata var. orbiculata*	Large roundleaf orchid
36	SOC	Vascular plant	PLSP2	*Platanthera sparsiflora*	Canyon bog-orchid
37	S&M Cat A	Lichen	PSRA3	*Pseudocyphellaria rainierensis*	Rainier pseudocyphellaria lichen
38	S&M Cat A	Moss	SCPE9	*Schistostega pennata*	Moss
39	S&M Cat A	Moss	TEGE	*Tetraphis geniculata*	Moss
40	SEN	Lichen	THDI5	*Tholurna dissimilis*	Lichen
41	WA-SEN	Vascular plant	UTIN2	*Utricularia intermedia*	Flat-leaved bladderwort

Approximately 107 occurrences are documented[3] within the project area. A complete list of occurrences can be found in Attachment 2. Species document are listed in Table 4. 28 different species are documented of which 8 are Region 6 Sensitive and 22 are Survey and Manage species. 11 of the species are vascular plants; 4 are mosses; 3 are liverworts; 5 are lichen species; and, 5 are fungal species.

Table 4. Special Status Species Documented in the Project Area

#	Special Status	Lifeform	NRCS PLANTS Code	Scientific Name	Common Name
1	S&M Cat F	Vascular plant	ARTS	*Arceuthobium tsugense*	hemlock dwarf mistletoe
2	WA-Sen	Moss	BALE6	*Bartramiopsis lescurii*	Lescur's bartramiopsis moss
3	S&M Cat A	Vascular plant	BOMO	*Botrychium montanum*	mountain moonwort
4	WA-Sen	Vascular plant	CALA7	*Campanula lasiocarpa*	mountain harebell
5	WA-Sen	Vascular plant	CAMAI2	*Carex magellanica ssp. irrigua*	boreal bog sedge
6	WA-Sen	Vascular plant	CAPA19	*Carex pauciflora*	fewflower sedge
7	WA-Sen	Vascular plant	CAST10	*Carex stylosa*	variegated sedge
8	S&M Cat E	Lichen	CECE	*Cetrelia cetrarioides*	none
9	S&M Cat B	Lichen	CHCH14	*Chaenotheca chrysocephala*	needle lichen
10	WA-Sen And S&M Cat A	Vascular plant	COAS	*Coptis aspleniifolia*	fernleaf goldthread
11	S&M Cat F	Vascular plant	COBA11	*Collybia bakerensis*	none
12	S&M Cat B	Fungus	CYLA13	*Cyphellostereum laeve*	none
13	Sen	Vascular plant	FRCA5	*Fritillaria camschatcensis*	Kamchatka fritillary
14	S&M Cat B	Fungus	GARU2	*Gastroboletus ruber*	none
15	S&M Cat B	Fungus	GYCA4	*Gyromitra californica*	none
16	S&M Cat E	Liverwort	HEAD5	*Herbertus aduncus*	none
17	S&M Cat C	Lichen	HYDU60	*Hypogymnia duplicata*	duplicate tube lichen
18	S&M Cat B	Liverwort	MAEMA	*Marsupella emarginata var. aquatica*	none
19	Sen	Vascular plant	PIAL	*Pinus albicaulis*	whitebark pine
20	S&M Cat C	Vascular plant	PLORO	*Platanthera orbiculata var. orbiculata*	large roundleaved orchid
21	S&M Cat A	Lichen	PSRA3	*Pseudocyphellaria rainierensis*	Rainier pseudocyphellaria lichen
22	S&M Cat E	Moss	RAAQ2	*Racomitrium aquaticum*	aquatic racomitrium moss
23	S&M Cat B	Fungus	RAAR7	*Ramaria araiospora*	none
24	S&M Cat B	Fungus	RHSP9	*Rhodocybe speciosa*	none
25	S&M Cat A	Moss	SCPE9	*Schistostega pennata*	Goblin's gold
26	S&M Cat A	Moss	TEGE	*Tetraphis geniculata*	tetraphis moss
27	S&M Cat B	Liverwort	TRQU	*Tritomaria quinquedentata*	none
28	S&M Cat F	Lichen	USLO50	*Usnea longissima*	beard lichen

Of the 107 occurrences, 24 are within a proposed project stand. A list of occurrences documented in project stands can be found in the Project Record, Of the 24 occurrences, 22 are Survey and Manage species: *Hypogymnia duplicata*, *Platanthera orbiculata* var. *orbiculata*, *Racomitrium aquaticum*, *Rhydocybe speciosa*, and *Schistostega pennata*. Two occurrences are Region 6 Sensitive species: *Carex pauciflora* and *Fritillaria camschatensis*. An additional nine occurrences occur within 150-feet of a proposed treatment stand, including two Region 6 Sensitive species, *Carex magellanica* ssp. *irrigua* and *Carex stylosa*.

[3] *Botrychium pedunculosum* was listed as documented within the project area. This occurrence has been monitored seven times since it was documented in 1996. It has never been seen since. This occurrence is likely extinct and will not be included in this analysis.

Of the 107 occurrences documented within the project area, nine are within the ROW of Forest System Roads. A list of documented occurrences can be found in the Project Record. Two of the occurrences occur within the ROW of roads with proposed maintenance level changes. One species is a Survey and Manage lichen, *Hypogymnia duplicata*, and one species is the Region 6 Sensitive species, *Fritillaria camschatensis.*

Of the 107 occurrences documented within the project area, 31 occur within 150-feet of a Forest System Road. A list of documented occurrences can be found in the Project Record. Eleven of those occurrences occur along a Forest System Road with proposed maintenance level changes. Three species are Survey and Manage species: *Hypogymnia duplicata*, *Platanthera orbiculata* var. *orbiculata*, and *Schistostega pennata*. One species is a Region 6 Sensitive species, *Fritillaria camschatensis.*

Usnea longissimia was the only special status species documented at any of the proposed recreation and scenic area project sites. This species is a Survey and Manage Category F species.

Invasive Plants

Approximately 138 high priority invasive plant occurrences, occupying 556 acres, are documented within the project area. A list of all documented occurrences can be found in **Error! Reference source not found.**. Nine occurrences occur along roads adjacent to proposed project stands or proposed rock sources. One hundred and twenty-two of those occurrences occur along Forest System Roads, of which 91 acres occur directly within the ROW. 418 or the 556 mapped infestations are one of the yellow hawkweeds, either meadow or common. Tables 5 and 6 list documented invasive plant occurrences based on project location.

Table 5. Invasive Plants Documented Along Roads Adjacent to Treatment Stands

#	NRCS PLANT Code	*Scientific Name*	Common Name	Number of Mapped Occurrences	Total Acres Infestations Mapped
1	GERO	*Geranium robertianum*	Robert geranium	1	2.18
2	HICA10	*Hieracium caespitosum*	meadow hawkweed	2	41.88
3	HILA8	*Hieracium lachenalii*	common hawkweed	3	70.08
4	POBO10	*Polygonum bohemicum*	Bohemian knotweed	3	1.02
			Totals	**9**	**115.17**

Table 6. Invasive Plants Documented Along Forest System Roads

#	NRCS PLANT Code	*Scientific Name*	Common Name	Number of Mapped Occurrences	Total Acres Infestations Mapped Along FSR	Within 25-Foot ROW	Outside 25-Foot ROW
1	CENTA	*Centaurea sp.*	knapweed	1	0.00	0.007	0.007
2	CIAR4	*Cirsium arvense*	Canada thistle	1	0.00	0.007	0.007
3	CIVU	*Cirsium vulgare*	bull thistle	7	0.11	0.10	0.02
4	CYSC4	*Cytisus scoparius*	Scotch broom	4	15.60	0.09	15.51
5	GERO	*Geranium robertianum*	Robert geranium	17	7.22	6.18	1.04
6	HEHE	*Hedera helix*	English ivy	1	0.01	0.00	0.00
7	HIAU	*Hieracium aurantiacum*	orange hawkweed	2	41.28	0.60	40.68

8	HICA10	*Hieracium caespitosum*	meadow hawkweed	20	103.25	28.03	75.22
9	HILA8	*Hieracium lachenalii*	common hawkweed	40	397.81	55.05	342.76
10	ILAQ80	*Ilex aquifolium*	English holly	2	0.01	0.01	0.00
11	LAGA2	*Lamiastrum galeobdolon*	yellow archangel	1	0.01	0.00	0.01
12	POBO10	*Polygonum bohemicum*	Bohemian knotweed	4	1.16	0.47	0.70
13	RUAR9	*Rubus armeniacus*	Himalayan blackberry	6	0.65	0.60	0.05
14	RULA	*Rubus laciniatus*	evergreen blackberry	15	0.26	0.26	0.00
15	SOAR2	*Sonchus arvensis*	field sowthistle	1	0.00	0.00	0.00
			Totals	**122**	**556.15**	**91.38**	**475.99**

10. Environmental Effects (includes Cumulative)

Consideration within this analysis:

A direct effect is the result of an action that has an immediate impact in time and space. For this analysis, a direct effect is any action that has an immediate impact on a special status plant or contributes to the introduction or spread of an invasive plant within the project area.

Indirect effects are those effects that occur at a different place or later point in time after project implementation. For this analysis, an indirect effect is any action that may later affect a special status plant or invasive plant within the project area.

Direction, intensity, and duration of the effects in comparison to untreated landscapes are considered in analysis.

Stand Treatments and Connected Actions

Stand Treatments vary across the project area. Stands may have either a commercial or noncommercial harvest prescription. Commercial harvest involves the use of ground based heavy machinery to remove trees, and at times a yarding system to move logs to the roadway. Yarding corridors, temporary roads, and landings may be cleared and utilized. In most cases, these will all be located within proposed stands. Individual trees outside of proposed stands may be used as cable anchors. Connected actions may include daylighting of roads, culvert replacement, and the clearing and use of rock pits/sources. Noncommercial harvest involves no heavy machinery. Trees would be felled with chainsaws and left on the ground.

The analysis area for direct effects on special status plants or the area of concern for invasive plants are the proposed stands, temporary roads, and rock pits/sources where ground-disturbing activities may occur. The analysis area for indirect effects on special status plants or the area of concern for invasive plants is the direct effects analysis area plus a 150-foot buffer.

Because there are only slight difference between the action alternatives for commercial thinning, a separate analysis was not completed for each alternative. The effects to rare plants are expected to be relatively the same for each alternative. Because little effects are expected from pre-commercial thinning, a separate analysis was not completed for each alternative even though less acreage would be pre-commercially thinned in Alternatives 2A and 2B.

Access Travel Management

Road maintenance level is directly correlated to frequency or intensity of treatments. Road maintenance level correlates with ease of access, or drivability. The higher the maintenance level, the easier the road is to drive, thus the more use a road may receive, and lastly vehicles may be able to travel at higher speeds. General maintenance activities may occur more frequently on roads that are more commonly used. Conversely, the lower the road maintenance level, the higher potential for treatments that include more intense ground disturbing activities.

Road treatments are prescribed for each of the road maintenance levels. Each treatment separately, or combined, can have a different effect on the road edge habitat. While a typical treatment for MLs 5-2 are general maintenance, the actions of road stabilization and replacement of culverts is also included (as defined in descriptor A3). Treatments for ML 1 roads and some decommission roads have a suite of treatments (descriptors P1, A1 and A2) that include removal of all drainage features, such as culverts and bridges, blocking of the entrance, in some cases converting the road to a trail, and the possibility of passively allowing the road to revegetate. Treatments for decommission roads, descriptor A2, involve complete obliteration of the road: removal of all drainage features, the roadbed, and in some cases re-contouring of the roadbed.

Because the vegetation along the ROW is brushed and mowed, 33-feet out from road center is the area of potential direct impact. The area beyond the ROW, in which no direct impacts occur, is the area of potential indirect impact. This area is defined as 150-feet from road center.

Recreation and Scenic Area Management

The analysis area for direct and indirect effects on special status plants or the area of concern for invasive plants are the proposed sites.

Effects Analysis

Special Status Plants

Rare plants can be negatively affected by timber harvest and connected actions, road maintenance and decommissioning, and recreation site enhancement. Effects can be caused by, but not limited to, direct injury, solar exposure alteration, hydrologic pattern alteration, soil alteration, microclimate alteration, and/or invasive species introduction. The degree of effects is relative to where a population occurs in relation to disturbing activities. In addition, the extent and duration of the effects may influence the magnitude of direct and indirect effects.

Alternative 1 – No Action

No actions would occur under Alternative A. No impacts are expected to documented special status plants beyond those that are presently occurring.

Alternative 2, 2A, and 2B – Effects Common to All Action Alternatives

Stand Treatments and Connected Actions

No direct impacts are expected to documented special status plants from the treatment of stands or any of the connected actions. Survey and Manage species are exempt from management under the Pechman Exemption. The two Region 6 Sensitive species, *Carex pauciflora* and *Fritillaria camschatensis* occurrences, both occur within wetlands within noncommercial treatment stands. These sites would have a 30-foot no-cut wetland buffer. There would likely be no change in microclimate from the removal of, in most cases, small diameter non-merchantable conifers greater than 30-feet from either wetland.

No indirect impacts are expected to documented special status plants from the treatment of stands or any of the connected actions. Survey and Manage species are exempt from Survey and Manage requirements under the Pechman Exemption. The four Region 6 Sensitive species occurrences, *Carex pauciflora*,

Carex magellanica ssp. *irrigua*, *Carex stylosa*, and *Fritillaria camschatensis* all occur within wetlands outside of noncommercial treatment stands. There would likely be no change in microclimate from the removal of, in most cases, small diameter non-merchantable conifers.

Impacts, either direct or indirect, may occur to those suspected Sensitive plants that might occur within treatment stands or along the route of any of the connected actions. The pre-field review lists preferred habitat for the suspected species and can be found in the project file. The likelihood of impacts is low. The majority of the stand treatment area is closed-canopy second growth forest that has been disturbed from timber harvest in the past. No upland Sensitive species prefers closed-canopy second growth forest, though incidental occurrences may occur. Management requirements have been put in place to prevent impacts to wetlands, though wetlands have not been not mapped in the project area nor will they be in the future, thus incidental impacts to these may occur due to the lack of oversight. No ground disturbing actions are proposed in the upper montane zone where the pre-commerical thinning stands are present, thus no impacts are suspected to the six *Carex* spp. No actions are proposed in the subalpine or alpine zone, along talus or rock-dominated slopes, thus no impacts are expected to species that prefer those sites. No actions are proposed in old-growth forest, thus no impacts are expected to species that prefer that habitat.

Table 7 lists suspected species that may be impacted from stand treatments and/or connected actions. Because suitable habitat occurs elsewhere on the Forest, and or known, stable, reproductive occurrences occur elsewhere on the Forest, impacts to the suspected species would likely not have a detrimental impact on the species viability on the Forest.

Table 7. Suspected Sensitive species that may be impacted from stand treatments

#	Status	Lifeform	NRCS PLANTS Code	Scientific Name	Common Name	May Impact?
1	SEN	Vascular plant	BOAS2	*Botrychium ascendens*	Upward-lobed moonwort	Yes. Forested habitats occur within treatment stands.
2	SEN	Vascular plant	BOPE4	*Botrychium pedunculosum*	Stalked moonwort	Yes. Forested habitats and streams side habitat occur within treatment stands.
3	WA-SEN	Vascular plant	CIBU	*Cicuta bulbifera*	Bulb-bearing water-hemlock	Yes. Slow moving streams and standing water occur within treatment stands.
4	WA-SEN	Lichen	DEME5	*Dermatocarpon meiophyllizum*	Lichen	Yes. Streams occur within treatment stands.
5	SEN	Vascular plant	FRCA5	*Fritillaria camschatcensis*	Black lily	Yes. Meadows occur within treatment stands.
6	S&M & SEN	Lichen	LECY60	*Leptogium cyanescens*	Lichen	Yes. Moist forested habitat occur within treatment stands.
7	WA-SEN	Vascular plant	MODI3	*Montia diffusa*	Branching montia	Yes. Moist forested habitat occur within treatment stands.
8	WA-SEN	Vascular plant	PLCH3	*Platanthera chorisiana*	Choris' bog-orchid	Yes. Moist forested habitat occur within treatment stands.
9	SEN	Vascular plant	PLOB	*Platanthera obtusata*	Small northern bog-orchid	Yes. Moist forested habitat occur within treatment stands.
10	WA-SEN	Vascular plant	UTIN2	*Utricularia intermedia*	Flat-leaved bladderwort	Yes. Slow moving streams and standing water occur within treatment stands.

Access Travel Management

Numerous Region 6 Sensitive plants and Survey and Manage plants are documented both within the ROW and within 150-feet of the road center. Although rare plants were not targeted during surveys, incidental species would have been recorded if found.

The last 0.17 miles of FS Route 4052000 is proposed to be downgraded from a ML 3 Road to a LL 1 Road. Although mapped both within the ROW and within 150-feet of the road center, the *Fritillaria camshcatensis* occurrence is located along the Kelcema Lake Trail, immediately after the trailhead, of Kelcema Lake trail, and would not be impacted by changes in maintenance. *Hypogymnia duplicata* occurs within 150-feet of the road center. There would be no indirect impacts to this species from either passive treatment (P1), Active Entrance Treatment (A1), or conversion or road to trail (A2) because no ground disturbing activities would occur within close proximity of the occurrence. The removals of drainage features (A2) along a ML 1 road are exempt from Survey and Manage requirements.

FS Route 4062000 is proposed to be downgraded from a ML 2 to a ML 1. There would be no direct impacts to the *Hypogymnia duplicata* occurrence beyond those currently occurring, because it does not occur within the ROW. There would be no indirect impacts to this species from either passive treatment (P1), Active Entrance Treatment (A1), or conversion or road to trail (A2) because no ground disturbing activities would occur within close proximity of the occurrence. The removals of drainage features (A2) along a ML 1 road are exempt from Survey and Manage requirements.

FS Route 4062016 is proposed to be decommissioned. Decommissioning of roads is exempt from Survey and Manage requirements; therefore, management of the *Hypogymnia duplicata* occurrence within 150-feet of the road center is not required.

FS Route 4021000 is proposed to be decommissioned. Decommissioning of roads is exempt from Survey and Manage requirements; therefore, management of the *Hypogymnia duplicata* occurrence within 150-feet of the road center is not required.

The last 0.34 miles of FS Route 4063000 is proposed to be converted from a ML 1 road to a trail, or foot-path. Because there would be no change in maintenance actions, no impacts are expected to the Survey and Manage Species *Hypogymnia duplicata* which occurs on a tree within the ROW. *Platanthera orbiculata* var. *orbiculata* occurs within 150-feet of the road center. There would be no direct impacts to this species because there would be no change in maintenance actions.

FS Route 4009000 is proposed to be downgraded from a ML 2 to a ML 1. There would be no direct impacts to the *Schistestega pennata* occurrence beyond those currently occurring, because it does not occur within the ROW. There would be no indirect impacts to this species from either passive treatment (P1), Active Entrance Treatment (A1), or conversion or road to trail (A2) because no ground disturbing activities would occur within close proximity of the occurrence. The removals of drainage features (A2) along a ML 1 road are exempt from Survey and Manage requirements.

Recreation and Scenic Area Management

Usnea longissimia has been documented at the proposed Heather Lake Trailhead expansion project. This species is a Survey and Manage Category F species and management is not required.

Invasive Plants

Invasive plants can be affected by timber harvest and connected actions, road maintenance and decommissioning, and recreation site enhancement. Potential effects can include introduction, establishment, and spread of invasive plants within the project area.

Alternative 1 – No Action

No actions would occur under Alternative A. No impacts are expected to documented invasive plants beyond those that are presently occurring. Most existing infestations in the project area are unmanaged.

Alternative 2, 2A, and 2B – Effects Common to All Action Alternatives

Invasive plants are widely distributed and abundant in the project area. Management requirements are in place to limit the introduction, establishment, and spread of invasive plants. Prevention measures to limit the introduction of invasive plants include the requirement to clean all equipment before coming on the forest, the use of weed-free gravel and fill, etc. Measures in place to reduce the spread of existing occurrences include the requirement to work from a weed-free area first before moving into infested areas. Only those roads and rock pits/sources in which ground-disturbing activities would occur require pre-implementation treatments. These measures are unlikely to contain all existing infestations.

Post-disturbance monitoring would allow early detection of new infestations or existing infestations that may be expanding into newly disturbed sites. This would also allow rapid response, taking immediate action to treat or control the infestation while small and or at the early stage of expansion.

All areas that are disturbed have the potential to be colonized by invasive plants. Road (re)construction and maintenance activities include the movement of soil and rock material that may be contaminated with plant propagule material, including a dormant seed bank. Timber harvest would cause decreased canopy cover and ground cover, in addition to increased ground disturbance. Most of the documented invasive species are shade intolerant. Opening the canopy may increase the amount of habitat suitable for establishment. Many treatment stands are adjacent to infested roadsides. With increased ground disturbance and movement of potentially contaminated material, there is the potential for existing infestations to expand into newly disturbed sites, such as reconstructed and temporary roads, and treatment stands, and to expand farther along existing roadsides.

Potential effects from road treatments may result in the introduction, establishment, and/or spread of invasive species. The effects of these species on road edge habitat may include: 1) alteration in vegetation composition, 2) decreased wildlife habitat, and 3) decreased habitat for native pollinators. Invasives species that occur within the ROW are most likely to be impacted by road treatments. Continued disturbance of the road edge creates habitat for invasion. Invasive species that occur outside of the ROW are unlikely to be impacted by road treatments because there are no ground-disturbing activities outside the ROW.

Decommissioning or closing of roads would have the greatest effect of limiting the continued disturbance under which invasive plants thrive as well as stop the route of entry into new areas previously un-infested. Road decommissioning, or in some cases closure, would reduce the spread of invasives if current forest policy continues so that plants are treated prior to decommissioning or closure is implemented. Conversely, if invasives cannot be treated or restoration has not taken place prior to closure, lack of access could prevent future treatment or restoration of infested sites.

Cumulative Effects Common to All Action Alternatives

Cumulative effects are the accumulation of direct and indirect effects, due to the repetition and interaction over time, by other actions in the past, present, and foreseeable future, in addition to the proposed action. For this analysis, a cumulative effect is the result of the accumulation of impacts that may affect a rare plant or cause the introduction or spread of an invasive plant within the project area. The entire extent of South Fork Stillaguamish Watershed, also the Project Area, served as the cumulative effects analysis area. This area encompasses approximately 65,228 acres.

Within the South Fork Stillaguamish Watershed, activities causing disturbance to vegetation in the past, present and future are largely a result of timber stand harvest and management and road (re)construction and maintenance, and to a lesser extent, special uses, recreation, and fish and wildlife habitat

enhancement projects. The accumulation of direct and indirect impacts from these activities has resulted in vegetation alteration or modification.

Disturbance can be a temporary or long-term change in environmental conditions that may result in changes in vegetation composition. Some plant species favor disturbances and early-successional stages, while other plant species favor late-successional stages. Habitat alteration can occur when vegetation is impacted beyond immediate or short-term recovery. Loss of habitat can occur when vegetation is unable to recover over time.

Vegetation modification can decrease the available suitable habitat for rare plants, while increasing the suitable habitat for invasive plants. An altered habitat can result from, but is not limited to, the accumulation of changes in solar exposure, hydrologic patterns, soil microbial and fungal activities, air quality, water quality, microclimate, ground cover, competition, organic litter, mineral soil compaction, and/or sediment movement. Suitable habitat has not been quantitatively or even qualitatively described for many rare or many invasive plants. Suitable habitat, for this analysis, is the environmental gradient and species assemblage in which a species of concern is typically found.

11. Biological Evaluation Determination

The action alternatives would not impact the existing occurrences of *Carex pauciflora*, *Carex magellanica* ssp. *irrigua*, *Carex stylosa*, and *Fritillaria camschatensis*, Pacific Northwest Regional Forester's Sensitive species.

The action alternatives may impact individuals or habitat of suspected *Botrychium ascendens*, *Botrychium pedunculosum*, *Cicuta bulbifera*, *Dermatocarpon meiophyllizum*, *Fritillaria canschatcensis*, *Leptogium cyanescens*, *Montia diffusa*, *Platanthera chorisiana*, *Platanthera obtusata*, or *Utriculata intermedia* – all Pacific Northwest Regional Forester's Sensitive species – but will not likely contribute to a trend towards federal listing or cause a loss of viability to each population or species on the Forest

12. Forest Plan Consistency

All Alternatives would be consistent with the standards and guidelines of the Forest Plan, as amended. All required standards and guidelines are proposed to be implemented.

13. Public Comment Response

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14. References and Citations

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15. Attachments

All attachments can be found in the Project Record.

End